Drivers of Land Abandonment in Neelakantha Municipality: Perception of Farmers

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Abstract

This study analysed the role of factors for land abandonment in Neelakantha municipality, Dhading. For this purpose, survey and causal-comparative research design are used. Similarly, Reliability and normality of the collected data was ensured by using cronbach alpha and Shapiro-Wilk test respectively. Then after, inferential statistical tools i.e. Pearson correlation and multiple regression analysis have been used to derive the result of the study. This study found that there is a significant impact of high cost of agro product, out migration, rough topography, lack of government protection from international competition, and destruction of food crops by wild animals on land abandonment. However, the impact of irrigation facility and market access on land abandonment was not statistically significant. The findings of the study suggest that the factors that contribute to land abandonment are complex and interrelated. However, the study provides some evidence that the factors that were found to be statistically significant can play a role in land abandonment.

Keywords: destruction of food crops by wild animals, high cost of agro product, land abandonment, out migration, rough topography,

Introduction

Agricultural land abandonment is often referred to as the cessation of farming and giving away land for natural cycle, such as grasses, shrubs, and trees on former agricultural lands. But, it may also result in land degradation. This phenomenon has emerged as a significant concern in Nepal. Though agriculture is a primary source of livelihood for significant portion of the population, this sector is facing a significant challenge in recent years due to the increasing trend of agricultural land abandonment.

Globally, people are looking for more land to intensify agriculture for food security around the world today. However, in Nepal, a quite opposite phenomenon is taking place. The arable land in Nepal is being abandoned in recent years. 37% of arable land is abandoned in Nepal (Paudel *et al.*, 2014). Rai et al. (2019) found significant regional variations in farmland abandonment. The highest abandonment rate was observed in the Mountain region (nearly 48%), followed by the Hill region (around 15%). Notably, Subedi et al. (2022) focused on the Hill region of Nepal, revealing a

concerning trend with 40% of agricultural land abandoned and 60% of farmers having unused plots.

The increasing land abandonment in Nepal has been posing multiple threats related to food insecurity, loss of rural livelihoods, reduction in crop production, loss of soil productivity, and damage on ecological landscape. More than 65% of the rural people depending on agriculture for their livelihoods are in search of alternative options viewing that subsistence agriculture farming is not able to meet the demand for food and income to sustain their families (Paudel *et al.*, 2014). The implication of agricultural land abandonment is not limited only at the household level, but has an overall impact on the national economy. For example, the Gross Domestic Product (GDP) contribution of agriculture sector was 33 per cent in 2011, but this figure has been expected to reduce 23.9% in 2022 (Ministry of Finance, 2078/79). This shows that agricultural land abandonment has emerged as a big challenge and problem in Nepalese economy. It has emerged as a complex issue with far-reaching consequences for people, the economy, and the environment.

A comprehensive national study on agricultural land abandonment in Nepal is still lacking. Limited studies have been found about it. The findings of these studies in Nepal are generally consistent. It found that the problem is widespread and that it is caused by a variety of factors. The studies have also found that land abandonment has a number of negative consequences, such as reduced food production, increased poverty, and environmental degradation. Recently, the Agriculture Census (2021/22) has shown that the agricultural land in Nepal has been decreased in the last decade by 12%. It means agricultural land in the country has reduced by 300000 hectares i.e. from 2500000 hectares to 2200000 hectares in the last 10 years. Chaudhary et al. (2020) had analyzed the farmland abandonment in Nepal and found that farmland abandonment demonstrated a variety of interrelated adverse consequences (e.g., the loss of agricultural farmland, triggering of natural hazards, changes in the socio-cultural landscape, and the loss of a unique identity) in the mountainous landscape of Nepal.

Different researchers have investigated about the land abandonment. Dahal et al. (2020) have studied the reutilization of abandoned land by adopting agro forestry. This study revealed that 47 per cent of the arable land in the study sites is abandoned. The study also identified multiple factors with proximate and underlying causes behind land abandonment such as: out-migration of farm labor particularly youths causing shortage of labor to cultivate land, decreasing soil productivity, increasing cost of production, increasing urbanization, reducing government subsidies, declining water sources, damage of crops by wild animals particularly monkey in the mid-hills, unclear and insecure land

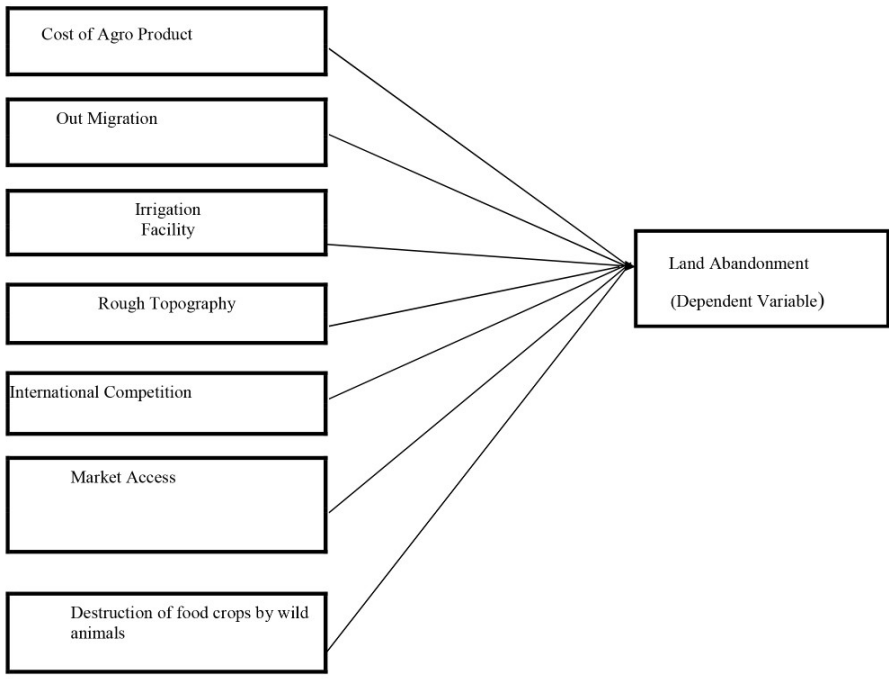
tenure policy among others. The study also identified a number of suitable agro forestry options to reutilize the abandoned land such as *Uttis* and cardamom along with lime, banana and fodder species. Ojha et al. (2017) analyzed the causes of land abandonment in Lamjung and Kavre districts and identified that land abandonment is caused by a combination of social and environmental factors that operate at different levels, but are ultimately rooted in the local dynamics of agricultural change. The study found that the lack of opportunities to generate cash income from farming and the growing insecurity of land tenure for share cropping are two of the main factors behind land abandonment.

Similarly, a study by Chidi (2015) in the Andhi Khola watershed of Syangja district found that the main reason for land abandonment is the large-scale out-migration of young people from rural areas. However, there are other factors as well, such as: sloppy land with increasing landslides, higher cost of production, increasing damage to agricultural crops by wild animals in the mid-hills and inadequate water supply for irrigation. The study also found that the out-migration of young people is due to a number of factors, such as the lack of opportunities in agriculture, the desire for better education and employment opportunities, and the perception that life in urban areas is better. Similar to this, Paudel et al. (2014) identified three main causes of land abandonment: decreased agricultural productivity and production; labour shortages brought on by seasonal or permanent migration; and socio-political instability that compelled people to leave their villages for urban centers in the Kavre, Lamjung, Parbat, and Pyuthan districts. The study also found that poor households' land is abandoned because it is typically of poor quality and is located in peripheral areas. The reason for this is that lower income households cannot buy high-quality land, which commands a higher price. Therefore, they do not see a comparative benefit to using their labour and resources to produce crops. Instead, low-income individuals enjoy working as day labourers in cities. Similarly, Khanal and Watanabe (2006) also examined the extent, causes, and consequences of abandonment of agricultural land near the village of Sikles by using the household survey to collect the socioeconomic information. They showed nearly 49% of all khet land (irrigated land) and 37% of all bari land (dry land) had been abandoned. About 10% of all khet land had been completely damaged by landslides and floods. Nearly 41% of all abandoned plots were subjected to different forms of geomorphic damage. It concluded that prevailing government policies and acts are not effective in managing abandoned land. This phenomenon has recently led to pronounced socioeconomic and environmental problems in Nepal. All these studies have indicated increasing trend of land abandonment in Nepal. This paper attempts to analyses the perceptions of the farmers of the regarding land abandonment. This research work has tried to analyze and accesses the role of different factors for land abandonment. This will be beneficial to formulate sound agro policy for concerned authority to increase investment in agriculture sector,

enhance food security, improve rural livelihoods and protect bio-diversity.

Conceptual Framework

On the basis of existing theoretical and empirical evidences on the determinants of land abandonment, conceptual framework of this research work is presented in terms of figure 1:



(Independent Variables)

Sources: Adaption from Paudel, et.al. (2014), (Chidi, 2015), (Ojha et al., 2017) and (Dahal et al., 2020).

Figure 1: Conceptual framework

Development of Hypothesis

Following hypothesis are formulated to analyze the perceptions of farmers regarding the land abandonment:

$H_{A:}$ There is statistically significant impact of high cost of agro product, out migration, irrigation facility, rough topography, lack of government protection, lack of market access and destruction of food crops by wild animals on land abandonment.

Research Methodology

Nature of this study is survey and causal- comparative research design. Study area of this research work is confined to Neelakantha Municipality, Dhading. Owners of abandoned land have been considered population. Of them, 20 peasants are selected as the sample by using stratified random sampling. This study is completely based on primary sources of data collected from 5 point likert scale questionnaire to analyze the perception of farmers regarding the land abandonment. The scale is: 1= strongly disagree, 2= disagree, 3 =neutral, 4= agree, 5 = strongly agree.

To assure external validity, measures have been taken to collect a sample that is as representative as possible. To maximize content validity, a comprehensive literature review is done to grasp the major variables. Similarly, reliability and normality of the collected data was ensured by using cronbach alpha and Shapiro-Wilk test respectively. Then after, descriptive statistical tools (i.e. mean, standard deviation and variances) and inferential statistical tools i.e. Pearson correlation and multiple regression analysis have been used to derive the valid result of the study.

Following regression model was developed to analyze the role of different factors that causes the land abandonment:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 - \beta_3 X3 + \beta_4 X_4 + \beta_5 X_5 - \beta_6 X_6 + \beta_7 X_7 + u_t$$

Where, Y = Land abandonment, X_1 = Cost of agro product, X_2 = Out migration, X_3 = Irrigation facility, X_4 = Rough topography, X_5 = International competition, X_6 = Market access, X_7 =Destruction of Food crops by Wild animals, α = Constant, u_t = Random error term and $\beta 1$, $\beta_2 ... \beta_7$ = Regression coefficients of X_1 to X_7 respectively.

Results and Discussion

Descriptive analysis

Table 1

Descriptive statistics

Independent Veriable	N	Mean	Std. Deviation	Variance
Land abandonment(LA)	20	3.863	.5805	.337
High cost of agro-product (HCA)	20	4.321	.4194	.176

Out migration (OM)	20	4.317	.4289	.184
Irrigation facility (IF)	20	3.225	1.0321	1.005
Rough topography (RT)	20	3.258	.4667	.218
International competition (IC)	20	3.971	.2880	.083
Market access (MA)	20	3.678	.3530	.125
Destruction of food crops by wild animals (DFCW)	20	4.429	.4681	.219
Valid N (list wise)	20			

The above table shows the mean and standard deviation of the independent variables i.e. high cost of agro product, out migration, irrigation facility, rough topography, international competition, market access, destruction of food crops by wild animals and independent variable land abandonment. According to the descriptive analysis all the variables have a score around 4 or greater than 4 indicating a tendency towards agree which means farmers perceive that these variables (HCA, OM, IF, RT, IC, MA and DFCW) have significant relationship with the land abandonment in Neelakantha Municipality. Similarly, standard deviations of all of the variables are relatively smaller suggesting less fluctuation in the distribution. Likewise, variances of all of the variables are even smaller than standard deviation. it also implies less fluctuation in distributions.

Inferential Analysis

Relationship analysis of variables

Correlational analysis is presented in table 1:

Table 2

Correlation between variables

Pearson Correlation		
Independent Variables		Land abandonment
High Cost of agro product	Pearson Correlation	0.393
	N	20
Out migration	Pearson Correlation	0.473
	N	20

Irrigation Facility	Pearson Correlation	-0.532
	N	20
Rough topography	Pearson Correlation	0.54
	N	20
International competition	Pearson Correlation	0.33
	N	20
Market Access	Pearson Correlation	-0.624
	N	20
Destruction of food crops by wild animals	Pearson Correlation	0.732
	N	20

Table 2 shows the relationship between land abandonment and other variables i.e. high cost of agro product, out migration, irrigation facility, rough topography, lack of protection of farmers from international competition, lack of Market access for land abandonment and destruction of food crops by wild animals. The destruction of food crops by wild animals and land abandonment have a high positive association (r = 0.732). This implies that land abandonment tends to rise along with the amount of food crops destroyed by wild animals. This suggests that the amount of food crops damaged by wild animals likely to increase along with land abandonment. Land abandonment and outmigration have a weakly positive connection (r = 0.473). This indicates that land abandonment tends to rise along with outmigration. Other relationships are less strong. There is a moderate positive correlation between the cost of agro product and land abandonment (r = 0.393, N = 20) implying that when cost of agro product increases, the likelihood of land abandonment also increases. The same things hold in case of rough topography. There is a moderate positive correlation between rough topography and land abandonment (r = 0.54, N = 20). This means that as the topography becomes more rugged, the likelihood of land abandonment increases. Similarly, There is a moderate negative correlation between irrigation facility and land abandonment (r = -0.532, N = 20) showing that as the availability of irrigation facilities increases, the likelihood of land abandonment decreases. There is a weak positive correlation between international competition and land abandonment (r = 0.33, N = 20). This means that as international competition increases, the likelihood of land abandonment may increase slightly. There is a moderate negative correlation between market access and land abandonment (r = -0.624, N = 20). This means that as market access increases, the likelihood of land abandonment decreases.

It is important to note that correlation does not equal causation. Just because two variables are correlated does not mean that one causes the other. For example, the correlation between out migration and land abandonment does not mean that out

migration causes land abandonment. It is possible that both out migration and land abandonment are caused by a third factor, such as economic hardship.

Regression analysis

The results of model summary and beta coefficients of impact of independent variables on land abandonment are presented in following table.

Table 3: Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.783[a]	0.613	0.532	0.5822

a. Predictors: (Constant), DFCW, IC, HCA, OM, IF, MA, RT

Table 3 presents the model summary. R value i.e. the correlation coefficient between the independent variables and the dependent variable is equal to 0.783. It indicates that there is a strong positive correlation between the independent variables and the dependent variable. Similarly, The R Square value is 0.613. It indicates that 61.3% variance in land abandonment is explained by the independent variables. On the other hand, the Adjusted R Square is a more accurate measure of the variance in dependent variable explained by the independent variables. The Adjusted R Square value of 0.532 indicates that 53.2% of the variance in land abandonment is explained by the independent variables, after taking into account the number of independent variables in the model. The Std. Error of the Estimate of 0.5822 indicates that the predicted values are typically within 0.5822 of the actual values. The predictions are relatively close to the actual values. The independent variables DFCW, IC, HCA, OM, IF, MA, and RT can be used to predict the dependent variable.

Table 4

Regression Coefficients

Coefficients[a]

Model B	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	Std. Error	Beta			

1	(Constant)	3.015	4.469		0.675	0.513
	HCA	0.318	0.339	0.230	0.937	0.036
	OM	0.254	0.356	0.188	0.715	0.048
	IF	-0.260	0.177	-0.464	-1.477	0.166
	RT	0.489	0.718	0.393	0.681	0.042
	IC	0.720	1.078	0.357	0.668	0.034
	MA	-0.936	0.575	-0.569	-1.629	0.129
	DFCW	0.390	0.344	0.315	1.134	0.028

a. Dependent Variable: LA

Table 4 shows that the regression model is able to predict the dependent variable significantly. Regression coefficient of high cost of agro product, out migration, irrigation facility, Rough topography, international competition, market access and destruction of food crops by wild animals are 0.23, 0.188, -0.464, 0.393, 0.357, -0.569 and 0.315 respectively. There is positive relationship between HCA and land abandonment and it is also statistically significant at 5% level of significance. The same things hold in case of OM, RT, IC and DFCW. It implies that positive changes in HCA, OM, RT, IC and DFCW also increases the land abandonment and vice versa and alternative hypotheses are accepted. On the other hand, there is negative relationship between IF and MA but it is statistically insignificant at 5% level of significance. It implies that increase in IF and MA deceases the Land abandonment but it is statistically insignificant and alternative hypothesis are rejected.

Discussion

This study investigated farmers' perceptions of land abandonment in Neelakantha Municipality, Nepal. The findings confirm a significant trend of agricultural land abandonment. The descriptive analysis identified several factors perceived by farmers to be influential, including high production costs, out-migration, challenging topography, limited irrigation, international competition, market access difficulties, and wild animal damage. The inferential analysis further strengthens the connection between land abandonment and factors like production costs, out-migration, rough terrain, lack of protection from international competition, and wild animal destruction. These findings suggest a complex interplay between economic, social, and environmental factors driving land abandonment in Nepal.

The findings confirm a significant trend of agricultural land abandonment, aligning with previous research by (Paudel et al., 2014) (Chidi, 2015), (Ojha et al., 2017) and

(Dahal et al., 2020). These studies found that migration, unfertile tough topography and wild animal's damage of agro output caused the land abandonment. The current study's results resonate with existing literature. This reinforces the notion that land abandonment is a multifaceted issue with widespread consequences. However, the current study also highlights the perceived significance of high cost of production, lack of protection from international competition and limited market access, which require further investigation in diverse geographical contexts of Nepal.

It provides valuable insights into the human dimension of land abandonment. However, the relatively small sample size and confined geographical scope limit the generalizability of the findings. Future research could benefit from a larger, more geographically diverse sample to strengthen the generalizability of these results.

Conclusion

Land abandonment is a serious problem and challenge of the Nepalese economy. It can lead to a decrease in agricultural production, which can lead to food insecurity in rural areas. It can also lead to soil erosion, as the land is no longer protected by vegetation. Land abandonment can also lead to a loss of biodiversity, as the habitats of many plants and animals are lost. Additionally, abandoned land is more likely to catch fire, which can pose a threat to nearby communities. Finally, land abandonment can lead to rural depopulation, as people move to cities in search of better job opportunities. It is important to address the factors that contribute to land abandonment in order to mitigate its negative consequences. Governments, development organizations, and farmers can all work together to find sustainable solutions to this problem.

Based on the descriptive analysis, it can be concluded that the farmers in Neelakantha Municipality perceive that the High cost of agro product, Out migration, Irrigation facility, Rough topography, International competition, Market access and Destruction of food crops by wild animals have a significant relationship with land abandonment. It means this study suggests that there is a strong consensus among farmers that these variables are important factors in land abandonment. Similarly, Inferential analysis suggests that there is a statistically significant impact of high cost of agro product, out migration, rough topography, lack of government protection from international competition, and destruction of food crops by wild animals on land abandonment. However, the impact of irrigation facility and market access on land abandonment was not statistically significant. The findings of the study suggest that the factors that contribute to land abandonment are complex and interrelated. However, the study provides some evidence that the factors that were found to be statistically significant can play a role in land abandonment.

These findings suggest that land abandonment can be reduced by addressing the factors that contribute to it for protection of land as well as promotion of sustainable development and improvements of the livelihoods of the rural people. For example, governments can provide farmers with protection from wild animals and international competition, and they can also invest in irrigation and market infrastructure. Additionally, policies that encourage people to stay in rural areas may also help to reduce land abandonment.

However, this study also has some limitations. The sample size was relatively small, which may have limited the power of the study to detect significant relationships. Additionally, the study was conducted in a specific region, so the results may not be generalizable to other regions. More research is needed to better understand the complex factors that contribute to land abandonment and to develop effective interventions to address it. Despite these limitations, the study provides some valuable insights into the factors that contribute to land abandonment. These insights can be used to develop policies and interventions to address land abandonment and to protect the environment.

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